

**PROGRESS REPORT OF
WOLF POPULATION MONITORING
IN WISCONSIN
FOR THE PERIOD
OCTOBER 2000 - MARCH 2001**

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ABSTRACT

The monitoring of gray wolf (*Canis lupus*) populations in Wisconsin has occurred continuously since fall 1979. Gray wolves have been listed as a state threatened species since 1999, and have been listed as federally endangered since 1967 and 1974. Wolf population monitoring is a major activity of the 1999 Wisconsin wolf management plan. Wisconsin wolves have been at the reclassification goal of 80+ wolves for seven years, and were near the state delisting goal (250 wolves outside Indian reservations). A minimum count of 251-253 wolves was found in 66 packs and as 10 loners. A total of 243-244 wolves were counted outside of Indian reservations. The wolf population remained about the same as last year, probably due to the outbreak of sarcoptic mange. The mean winter territory of 22 adults was 34 square miles. Total occupied range of territorial wolves was 3340 square miles at a density of 1 wolf/14 square miles. An estimated 74 to 101 pups survived to late winter for an average survival rate of 28%.

INTRODUCTION

Wolves were extirpated from Wisconsin in the late 1950's, but recolonized the state in the mid 1970's. The Wisconsin DNR has conducted active monitoring of the wolf population since Fall 1979 using livetrapping, radio tracking, winter snow track surveys and summer howl surveys (Wydeven et al. 1995). Population monitoring was listed as an important activity in the 1989 wolf recovery plan for Wisconsin (Wisconsin DNR 1989), and the recently completed state wolf management plan (Wisconsin DNR 1999). The 1989 recovery plan set a goal of reclassification from state endangered to threatened once 80+ wolves were maintained for 3 or more years. The wolf population first exceeded 80+ in 1995, and was reclassified to threatened on 1 October 1999. The Federal Recovery Plan for gray wolves in the eastern U.S. established the same reclassification goal for Wisconsin, and set a regional delisting goal of 100 wolves in Wisconsin and Michigan, and 1251-1400 in Minnesota (U.S. Fish and Wildlife Service 1992). The U.S. Fish and Wildlife Service started the reclassification process for Wisconsin and Michigan in July 2000 (Minnesota has already been reclassified to threatened since 1978), and had intended to complete the process in July 2001. The change in the federal administration due to the 2000 election may delay this process. The 1999 Wisconsin wolf management plan established a state delisting goal of 250

wolves outside of Indian reservations, and a management goal of 350 wolves outside of Indian reservations. The present report covers wolf monitoring activity from 15 September 2000 through 14 April 2001 and is the second population count since the completion of the 1999 wolf management plan.

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METHODS

Radio telemetry surveys were conducted as described by Mech (1974), and were used to determine territory distribution and wolf numbers for collared packs (Fuller and Snow 1988). Aerial locations were obtained on VHF radio collared wolves about once per week. Two wolves monitored by satellite radio collars (Ballard et al 1998) produced useable locations about 5 to 7 times per week. The highest count in mid or late winter was generally considered the pack size for population determination. Home range area for the winter period (15 September-14 April) was calculated using the minimum convex polygon (Mohr 1947); radio locations over 5 km from other points were considered extra-territorial moves (Fuller 1989). Home range area was calculated only for animals that occupied stable areas, and did not include dispersing wolves.

Snow tracking and sign surveys (Thiel and Welch 1981, Wydeven et al. 1996) were used to supplement surveys of packs without collared wolves, or in collared packs where few visual observations were made

from the air. Presence of double raised-leg urinations (RLU's) were generally used to determine breeding activity, especially when estrus blood was also present (Rothman and Mech 1979); breeding status was surmised for some packs based on regular breeding history in the past or large pack size. Pack size was determined by tracking wolves as far as possible along snow covered roads by vehicle, or off road by skies or snowshoes. Separations of packs were determined by distance between observations, as well as directions of movements, and timing of observations. Only track observations from experienced trackers or well documented observations were used to obtain the state wolf count. Observations reported by the general public or volunteers were used to focus survey activity, and usually only observations that were verified by experienced trackers were included in the state wolf count. Packs along the border with Michigan or Minnesota were included with the Wisconsin count only if 50% or more of the territory occurred in Wisconsin.

Area of wolf occupancy was determined by summing up the area of all packs in the state and multiplying by 1.37 to include 37% interstitial areas around the territories (Fuller et al 1992). Current year's information on home range area was used for collared packs, and values obtained within the last 3 years were used on previously collared packs. Statewide average values (34 mi²) were used to estimate area for non-collared packs, or packs not collared in the last three years.

Pup estimates in packs during winter were determined by change in numbers from previous surveys, knowledge of pup presence from summer howls, and knowledge of composition from previously captured animals. Pup survival was determined by taking the mid-point of the estimated number of pups, and dividing by the number of breeding females the previous winter multiplied by 5.2 pups (the average number of implanted fetuses in 5 female wolves examined in Wisconsin).

The winter of 2000-2001 was the sixth year that we used volunteer carnivore trackers to supplement DNR track surveys. All the heavily forested portions of northern and central Wisconsin were subdivided into 127 survey blocks averaging about 200 square miles each (Appendix 3). During the current winter, survey blocks were assigned to volunteer trackers for 100 survey blocks and useable data was returned on 52 blocks. Volunteers were asked to conduct at least 3 "good" surveys per block, and track about 60-100 miles of snow covered roads. Volunteer trackers included personnel from DNR-Wildlife Management, U.S. Forest Service, U.S. Army, National Park Service, Tribal biologists, university students and private citizens.

RESULTS AND DISCUSSION

A total of 66 packs/groups were detected in 20 Wisconsin counties (Figure 1). Nine packs were found in six central Wisconsin counties, and 57 packs occurred in 14 northern counties. As in 1999 and 2000, only 2 packs occurred in northeast Wisconsin. Radio collared wolves were monitored in 30 packs in the state during the winter. DNR wolf trackers surveyed over 4081 miles in 81 survey blocks.

Thirty-nine radio collared wolves were monitored during portions of the winter period in 30 Wisconsin packs, 1 Minnesota pack, and as loners (Table 1). Wolves 229F, 269F, 289F, 332F and 269M appeared to be mainly loners during the period, but 269M may have found a mate at the end of the period. Eleven wolves went off the air during the period including 8 dying, 2 losing signals, and 1 slipping its radio collar. Two wolves had moved into adjacent states (298M in Minnesota, 318F in Michigan), and 1 Michigan wolf moved into Wisconsin (M036F). During winter 2000-2001 monitoring occurred on 15 adult males, 16 adult females, 1 yearling male, 3 yearling females, 2 male pups and 2 female pups.

Mean winter home range of 25 wolves located 20 or more times was 35 square miles for VHF collars (Table 2). Mean territory size of 22 adults with VHF collars was 34 square miles, with a range from 20

square miles for the Tranus Lake and Ranger Island packs, to 70 square miles for the South Empire pack. The 2 wolves monitored by satellite collars averaged home range areas 3 times more than VHF collared wolves (Table 2). Similar ratios of difference between VHF and satellite collars have previously been documented (Ballard et al. 1998). Large size of home range for satellite collared wolves were due to larger number of locations, plus greater error in satellite telemetry (Ballard et al. 1998).

WOLF PACK AND LONE WOLF SUMMARIES

(Wolf packs are illustrated in Figure 1 but lone wolves are only described in the text. Nicknames for radio-collared wolves used in the field are listed in Appendix 1).

Truck Trail Pack - Douglas & Pine Counties - Block 2:

3 wolves; wolf 268M (adult male) observed on 7 of 17 radio locations with up to 2 other wolves; seen with 6 others on 9 November 2000, but winter counts were ≤ 3 ; winter territory 46 square miles; possibly 1 pup survived; breeding suspected.

Moose Road Pack - Douglas, Pine Counties - Block 2 & 11:

2 wolves; wolf 155M (adult male) observed on 8 of 17 radio locations with up to 1 other wolf; winter territory 26 square miles; no pup survival; possible breeding.

North Empire Pack - Douglas County - Block 3:

2 wolves; wolf 267M (adult male) observed on 8 of 17 radio locations with 1 other wolf; winter territory was 35 square miles; no pups apparently survived; possible breeding.

South Empire Pack - Douglas County - Block 3:

4 wolves; wolf 297M (adult male) observed on 10 of 17 radio locations with up to 3 other wolves; winter territory was 70 square miles; 1 or 2 pups apparently survived; breeding probably occurred.

Moose Lake Pack - Douglas County - Block 4:

4 wolves; wolves detected by 41.2 miles of track surveys by volunteers; RLU but no blood; breeding probably occurred; 2 pups may have survived from last year.

Shoberg Lake Pack - Douglas County - Block 6:

4 wolves; wolves detected by 24.5 miles of track survey by DNR; RLU but no blood; breeding probably occurred; 2 pups may have survived from last year.

Casey Creek Pack - Douglas County - Block 7:

4 wolves; new pack possibly from Lake Nabagemon loner or from Orienta Falls Pack; wolves detected with 42.0 miles of track survey by DNR; RLU but no blood; apparently had 3 surviving pups; probably bred again this year.

Chain Lakes Pack - Douglas & Washburn Counties - Block 8:

3 wolves; wolf 291M (adult male) was observed on 6 of 17 radio locations with up to 2 other wolves; winter territory was 46 square miles; possibly 1 pup survived from last year; 31 miles of track survey by DNR in area.

Bird Sanctuary Pack - Douglas County - Blocks 9 & 3:

4 wolves; alpha female 266 F died in late October from attack by other wolves; 39.4 miles of track survey by DNR detected 4 wolves; no evidence of breeding, but new female may have joined pack; possibly 2 pups survived.

Crotte Creek Pack - Douglas County - Blocks 9 & 10:

6 wolves; adult male 296M observed on 10 of 17 radio locations; winter territory 21 square miles; seen with up to 7 other wolves in early December, but all observations were of 6 or less (including 296M) after mid-December; probably 3 or 4 pups had survived and breeding again occurred. The Buckley Creek Pack found south of this pack, was no longer present in 2001 and may have been displaced by the Crotte Creek pack.

Chase Brook Pack - Burnett, Douglas & Pine Counties - Block 11:

4 wolves; adult female 724F was observed on 7 of 17 radio locations and was seen with up to 4 other wolves in mid December; track observations indicated 4 or less wolves in the pack the remainder of the winter, and DNR pilots observed only 2 wolves in the pack from January through March; winter territory was 32 square miles; possibly 1 or 2 pups survived.

Totagatic River Pack - Burnett & Washburn Counties - Block 10:

2 wolves; adult male 294M and adult female 295F were observed 11 and 9 times respectively at 18 radio locations; the 2 wolves were together on half of these locations; winter territory was 33 square miles for 294M and 35 square miles for 295F; no pups were apparently produced last year, but breeding may have occurred this year.

Stuntz Brook Area - Washburn County - Block 12:

1 wolf; only 1 wolf was detected in this former pack area during 65.1 miles of track surveys.

Crex Meadows Pack - Burnett County - Block 13:

2 wolves; wolves were detected by 53.8 miles of tracking by DNR; RLU's found, but no clear evidence of breeding.

Sterling Barrens Loner - Polk County - Block 14:

1 wolf; no wolves were detected on 55.0 miles of track survey by DNR, but a volunteer tracker found sign of a lone wolf with 57 miles of tracking; RLU's were present suggesting possible territory establishment.

Blue Hills Pack - Rusk & Sawyer Counties - Block 20:

5 wolves; wolves were detected along 163.5 miles of track surveys by DNR; a wolf pack had previously not been detected in this area, but tracks and scats were found in May 2000; RLU's were found and breeding was suspected; apparently 3 pups survived in this pack.

Frog Creek Pack - Washburn County - Blocks 22 & 23:

4 wolves; wolf 293F (Adult female) died in this territory due to mange prior to 14 February; up to 3 wolves were seen with her, but 16.9 miles of track surveys indicated as many as 5 prior to death of 293F; winter territory size was 24 square miles; possibly 1 or 2 pups survived from last year.

Tranus Lake Pack - Washburn County - Block 23:

5 wolves; adult male 292M was observed on 8 of 17 radio locations with up to 5 other wolves; probably 2 or 3 pups survived from last year; wolf 292M occupied a 20 square mile winter territory; breeding activity was suspected.

Ghost Lake Pack - Bayfield & Sawyer County - Block 24:

4 wolves; adult female 241F was observed 7 of 17 radio locations with up to 3 other wolves; winter territory was 42 square miles; although pup production had not previously been detected, it appears this pack may have had 1 or 2 pups produced and survive from last year; male wolf pup 250M from the Black Lake pack may have joined this pack in early spring; 62.3 miles of track survey were performed in this area, and RLU's were found.

Smoky Hill Pack - Bayfield & Sawyer Counties - Block 25:

4 wolves; wolves detected from 99.9 miles of track survey by DNR in this and Bearsdale Pack; RLU with estrus blood found on 5 February 2001; apparently 1 or 2 pups survived from last year.

Bearsdale Pack - Bayfield County - Block 25:

5 wolves; new pack probably split from Smoky Hill and surveyed with that pack; estrus blood detected on 25 January and 7 March 2001; pups apparently produced and at least 3 survived.

Moreland Lake - Bayfield & Douglas Counties - Block 26:

3 wolves; new pack that may have established last year, but went undetected; track surveys along 63.5 miles by DNR; RLU's detected and breeding suspected; possibly pups were produced in 2000 and 1 survived.

Rainbow Lake Pack - Bayfield County - Block 27 & 28:

2 wolves; wolves detected along 58.7 miles of track surveys by DNR; RLU's found but no estrus blood detected; possibly breeding occurred; no pups survived from last year.

Porcupine Lake Loner - Bayfield County - Block 29:

1 wolf; track surveys covered 73.8 miles by DNR in this block; RLU's detected, indicating territorial behavior by this wolf.

Flag River Pack - Bayfield County - Blocks 30, 31, & 32:

5 wolves; snowtracking conducted along 117.1 miles; RLU's and estrus blood found on 6 March 2001; probably 3 pups survived from last year.

Oriente Falls Pack - Bayfield & Douglas Counties - Block 31:

2 wolves; no wolves found on 12 miles of tracking by DNR, but local USDA-WS agent detected 2 wolves in area; possible breeding activity occurred.

Little Sioux River/Sand Point Pack - Bayfield County - Block 33:

3+ wolves; new pack first verified in fall 2000 when 6+ wolves responded to howls; 58.1 miles surveyed in area; on 27 March 2001, 1 wolf was found near Little Sioux River and 2+ wolves were detected on Sand Point about 12.5 miles to the north; lack of deer in the Little Sioux River area during winter and major concentration at Sand Point would cause wolves to migrate northward; trapping will be attempted next spring to determine if this is 1 or 2 packs. The northern tip of this territory extends into the Red Cliff Indian Reservation and the Apostle Islands National Lakeshore.

Hellhole Creek Pack - Bayfield & Ashland Counties - Blocks 34 & 35:

6 wolves; track surveys covering 222.3 miles were conducted to determine wolf numbers in this pack; RLU's were found and breeding was suspected; probably 2-4 pups survived from last year.

Brush Creek Pack - Ashland County - Block 36:

7 wolves; adult male 310M was observed 5 times out of 17 radio locations with up to 6 other wolves; the aerial count of 7 occurred in mid December 2000, and a track survey on 4 January 2001 indicated as many as 8, but sign indicated possibly 1 wolf severely injured; aerial counts after this date were of 5 or less; 107.6 miles of snowtracking were conducted in this pack area, and RLU's and estrus blood were detected on 9 March 2001; 310M occupied a winter territory of 30 square miles; possibly 3-5 pups survived from last year.

Black Lake Pack - Ashland & Sawyer County - Block 37:

4 wolves; male wolf pup 250M was observed 4 out of 17 radio locations with 2 other wolves; track surveys along 74.7 miles indicated 4 wolves in the pack; 250M occupied a winter range of 30 square miles in this pack area, but also made extensive extraterritorial moves to the northwest as far as Cable; 250M was probably the only surviving pup from last year; RLU's and estrus blood were detected on 16 February 2001.

Torch River Pack - Ashland County - Blocks 38 & 36:

5 wolves; adult male 248M was observed on 6 of 17 radio locations with up to 4 additional wolves; his winter territory was 22 square miles; apparently 2 or 3 pups survived from last year; breeding was again suspected; 127.6 miles of track surveys were done by DNR in Block 38, including this territory; RLU's and estrus blood were found on 2 February 2001. Areas roamed by the Torch River Pack included locations listed as Ding Dong Creek Pack last year; the Torch River Pack has perhaps taken over that area or the Ding Dong group were an extension of the Torch River Pack.

Shanagolden Pack - Ashland County - Block 38:

3 wolves; this pack was surveyed in Block 38 with 2 others along 127.6 miles of snow covered roads by DNR; RLU's and estrus blood were detected on 9 March 2001; 1 pup may have survived from last year.

Hungry Run Pair - Ashland County - Blocks 38 & 40:

2 wolves; this new pair occupied a territory on the south of the old Torch River territory and north of the Brunet River; along with packs to the north in Block 38 (127.6 miles) and packs to the south in Block 40 (158.8 miles); breeding probably occurred.

West Firebreak Pack - Ashland County - Block 39:

2 wolves; Tom Doolittle reported 2 wolves in this pack on the Bad River Reservation; yearling female M036F originating from Michigan may have joined this pack in late winter or early spring; she was observed on 3 of 5 radio locations with 1 other wolf; this pack apparently did not produce pups in 2000.

Morrison Creek Pack - Ashland & Iron Counties - Block 39 & 60:

3 wolves; Tom Doolittle reported 3 wolves in the Morrison Creek Pack that wintered along the Potato River in eastern parts of the Bad River Reservation; wolf M036F spent part of the winter in this pack area and covered 69 square miles; she may have dispersed to the West Firebreak Pack.

Brunet River Pair - Sawyer County - Block 40:

2 wolves; wolf 286F(adult female) was seen on 7 of 17 radio locations and with 1 other animal on 5 observations; she occupied a winter territory of 23 square miles; no pups were apparently produced last year; breeding was suspected; 158.8 miles of track survey were done in this block by DNR.

Log Creek Pack - Sawyer, Price & Ashland Counties - Block 40:

3 wolves; 158.8 miles of tracking were done in this block by DNR searching for this pack and adjacent packs; the pack was detected on only 1 of 6 surveys; RLU's were found, but not estrus blood; 1 pup may have survived from last year.

Thornapple River Pack - Sawyer County - Block 41:

2 wolves; 2 wolves found in this pack on 22 January 2001 along 6.8 miles of survey and displaying RLU's and estrus blood; possibly a third wolf was in this group, but not positively identified; probably no pups survived from last year.

Price Creek Pack - Price & Sawyer Counties - Block 41:

4 wolves; 57.4 miles of track survey were used to locate this pack; RLU's were found and breeding was suspected; possibly 1 or 2 pups survived from last year.

Davis Lake Pair - Price County - Block 41:

2 wolves; 2 non-breeding wolves were found southwest of Fifield on 10 March 2001 that appeared to be separated from the Price Creek Pack; these animals may have split off from the Price Creek Pack, and were not part of the 4 detected in that pack on 11 March 2001.

Tupper Creek - Sawyer County - Block 43:

2 wolves; snow track surveys by DNR covering 102.0 miles were used to detect this pack; breeding was suspected; no pups survived from last year.

Haystack Corner Pack - Sawyer & Rusk Counties - Block 43:

3 wolves; snow track surveys within this block by DNR covered 102.0 miles; RLU's were found but no estrus blood, although breeding probably occurred; possibly 1 pup survived from last year.

Kidrick Swamp Pack - Taylor County - Block 47:

5 wolves; 79.2 miles of snow tracking were conducted in this pack by DNR; 3 pups apparently survived from last year; breeding was again suspected.

Clifford Area Loner - Oneida & Price Counties - Block 51:

1 wolf; 104.0 miles were snow tracked in this area; one wolf showing territory marking behavior was found; a pair occupied this area last year.

Wilson Flowage Pack - Price County - Block 52:

3 wolves; wolf 334M (adult male) of this pack died early in winter from mange (28 December 2000); at the time 334M died, 3 wolves appeared to occur in this pack; volunteer trackers covered 58 miles during January-March 2001 and indicated 2-4 wolves continued to occur in this territory; possibly 1-2 pups survived from 2000, but breeding was not suspected in 2001.

Bootjack Lake Pack - Oneida & Price Counties - Block 53 & 52:

2 wolves; male wolf pup 353M was monitored until 14 March 2001, when his signal was lost; wolf 353M was seen with up to 5 other wolves, but observations with 4 or 5 other wolves were in the Wilson Flowage area and may have included members of that pack; in the traditional Bootjack Lake area no more than 2 wolves were seen with 353M; winter territory size was 39 square miles; 353M had not shown dispersal behavior before his disappearance, therefore he may have died; probably none of the 3 pups known to be alive last summer survived; RLU's with estrus blood were found on 20 February 2001 along 2.0 miles of track surveys by DNR.

Wintergreen Lake Pack - Price County - Block 54:

3 wolves; female wolf 316F was observed 3 out of 17 radio locations with up to 2 other wolves; 316F was not thought to have produced pups in 2000, therefore the third wolf in this group may be another wolf that has joined 316F and her mate; wolf 316F occupied a 52 square mile home range over winter.

Hoffman Lake Pack - Price, Ashland & Iron Counties - Block 55:

5 wolves; adult female 245F was seen with up to 4 other wolves; she occupied a winter territory of 35 square miles; apparently 2 or 3 pups survived; breeding was again suspected.

Murray's Landing Pair - Iron County - Block 55:

2 wolves; 2 wolves including one with a distinct foot drag pattern, were detected throughout the winter on the east side of the Flambeau Flowage; the Miles Lake Pack was not detected in Block 54 to the south (15 miles of survey) and perhaps these 2 represented that group; breeding may have occurred.

East Firelane Pack - Ashland & Iron County - Block 56:

3 wolves; 76.6 miles of tracking were done in Block 56, and RLU's and estrus blood was detected in this pack on 27 February 2001; 1 pup possibly survived from 2000.

Penokee Ridge Loner - Ashland County - Block 57:

0 wolves; wolf 229F appeared to be living by herself along the Penokee Ridge before her death sometime before 14 February 2001 from ear infection and mange; she may have had pups in the spring and summer, but none seemed to have survived; prior to her death, she occupied a home range of 21 square miles.

Augustine Lake Pack - Ashland & Iron Counties - Block 57:

5 wolves; 160.5 miles tracking by DNR with RLU's and estrus blood on 15 and 23 February 2001; probably 2-3 pups survived from last year.

Chippewa River Pack - Iron & Ashland Counties - Blocks 56, 57 & 58:

9 wolves; adult male 351M was observed on 8 of 18 radio locations with up to 8 other wolves; his winter territory covered 51 square miles; 76.6 miles of tracking were conducted in block 56 by DNR; breeding was again suspected; probably 5-6 pups had survived from last year.

Pine Lake Pack - Iron County - Block 59:

5 wolves; 38 miles of track surveys conducted by DNR; breeding probably occurred; 2-3 pups apparently survived from last year.

O'Brien Lake Pack - Iron County - Block 59:

3 wolves; track surveys were conducted along 79.4 miles by DNR in this block; RLU's and estrus blood were found on 22 February 2001; apparently 1 pup survived from last year.

Chaney Lake Pack - Gogebic & Iron Counties - Block 61:

Michigan pack with 7 wolves; wolves from this pack extend into Wisconsin along eastern Iron County; this pack covered an area of 54 square miles. Pups have been born on the Michigan side of the territory during the last 2 years and the pack is included as part of the Michigan wolf count. A total of 114.2 miles were surveyed in this block and adjacent areas in Michigan by Wisconsin DNR.

North Willow Pack - Oneida County - Block 65:

5 wolves; adult female 244 F was observed on 7 of 19 radio locations with up to 5 other wolves; her winter territory was 44 square miles; 29.4 miles were surveyed in this block by DNR; breeding was suspected; 11 wolves occurred in this pack last winter, therefore it was difficult to determine if the count of 5 included any pups, and pup survival could have been 0 to 1 or 2 animals.

Scotchman Lake Pack - Oneida County - Block 65:

2 wolves; 2 wolves north of the North Willow pack were detected along part of the 29.4 miles of the survey in this block; territory marking was detected, but it was unclear if breeding occurred; pups were either not produced or did not survive from last year.

Little Rice River Pack - Oneida County - Block 67:

0 wolves; Adult female 282F was observed only once by herself during 11 radio locations prior to her death sometime before 14 February 2001; she was shot to death and thrown into the Tomahawk River. No

additional wolf sign was found in this pack despite 84.5 miles of tracking by DNR and 19.7 miles tracking by volunteers.

Ranger Island Pack - Lincoln County - Block 68:

6 wolves; adult female 285F was observed on 10 of 19 radio locations with up to 5 other wolves; 3 or 4 pups survived from last year; wolf 285F occupied a 20 square mile territory in the winter; breeding was assumed and most locations of 285F after 14 March 2001 were near den site.

Averill Creek Pack - Lincoln County - Block 70:

5 wolves; 39 miles survey by DNR; breeding was suspected; apparently 3 pups survived from 2000.

Spirit Lake Pair - Lincoln County - Block 70 & 49:

2 wolves; during 39 miles of track survey in block 70, a pair of wolves separated from the Averill Creek pack were found in the north end of this block; RLU's and estrus blood were found on 19 February 2001; this pair may roam into Price and Taylor counties.

Wolf 332F - Oneida & Langlade Counties - Blocks 76, 77 & others:

1 wolf; adult female 332F was observed on 2 of 18 radio locations by herself. The wolf was relocated from west Oneida County to west Florence County after causing depredation in May 2000; during fall-winter 2000-2001, wolf 332F roamed SE Oneida and NE Langlade counties, and took one trip to east Forest County; most locations were north of Pelican Lake.

Nineweb Lake Pack - Vilas County - Block 81:

3 wolves; 3 wolves were detected along 29.5 miles of survey; breeding was suspected; no pups were thought to have survived from 2000; yearling female 318F from this pack made extensive movements northward into Michigan and appeared to have dispersed into Michigan by early spring.

Wolf 289F - Vilas County - Blocks 80, 81 & 82:

1 wolf; 113 locations were obtained for this wolf during the winter period (15 September - 14 April) but because she was monitored by satellite, no visuals were obtained; track surveys nearby and public observations suggest that she was by herself. This wolf was relocated from west Oneida to west Florence County after depredation in May 2000. She roamed a 98 square mile area between Land O' Lakes and Eagle River throughout the winter period, with most locations near Conover.

Giant Pine Pack - Forest County - Block 84 & 85:

2 wolves; only 2 wolves detected despite 106.8 miles of survey by DNR and 37.7 miles by volunteers; breeding activity was suspected, but apparently no pups survived from last year; 3 pups had been heard last summer.

Camp Three Lake - Forest County - Block 101:

1 wolf; 1 wolf found in this survey block east of Laona along 35.2 miles of tracking by DNR; a single wolf was also found along 79 miles of survey by volunteer trackers to east in Marinette County.

Amberg Area - Marinette County - Block 112:

Possibly Michigan wolves; 2 wolves were detected in northeast Marinette County on 52.6 miles of survey by volunteers, but believe to be a part of Michigan Pack to the east.

Iron Run Pack - Clark County - Block 117 & 118:

2 wolves; yearling female 309F was observed 2 times at 19 radio locations, and seen with 1 other wolf; wolf 309F occupied a winter territory of 20 square miles; breeding may have occurred; after this pair

formed, tracks of a single wolf were no longer observed in the Rock Dam area; 81.4 miles were tracked in these two blocks by DNR.

Noch Hanai Pack - Jackson County - Block 119:

4 wolves; although not collared, DNR pilot saw 4 wolves in pack on 19 March; 22.5 miles surveyed by DNR also detected 4 wolves; breeding suspected and possibly 1 or 2 pups survived from last year.

Two Korner Pack - Jackson County - Block 119:

2 wolves; 2 wolves detected along 55.7 miles of survey by DNR; but no pups survived from 2000; breeding suspected in 2001; possibly 269M has joined this group.

Wolf 269F - Jackson County - Block 119:

2 wolves; yearling male 269M originated from the Dead Creek Pack, and moved into the area north of Pray after 23 January; he was observed on 3 of 18 radio locations, with 1 other wolf on one location; he perhaps has formed a new pair (pack) with a member of the Noch Hanai or Two Korner Pack.

Wildcat Mound Pack - Jackson County - Block 120:

5 wolves; 53.6 miles were tracked in this area by DNR, and volunteers surveyed 111.0 miles; breeding was suspected; possibly 1 to 3 pups survived from last year; wolf 337M (adult male) occupied this territory in the fall, but dispersed after 30 November 2000.

Bear Bluff Pack - Jackson & Juneau Counties - Block 121:

4 wolves; 86.1 miles surveyed in this block by DNR; breeding was suspected; possibly 1 pup survived from last year. Yearling female 311F was monitored by satellite throughout the winter and occupied a home range of 125 square miles; because of the large number of radio locations possible with the satellite telemetry, home range area is not directly comparable to other wolves. Two wolves were detected on the east side of this territory, but it appears these may have been members of the Bear Bluff Pack, instead of the South Bluff pack that had previously been detected in this area.

Dead Creek Pack - Monroe, Jackson & Juneau Counties - Block 121 & 122:

5 wolves detected along 21.0 miles of track survey by DNR; breeding suspected; probably 1 or 2 pups survived from last year; wolf 269M (yearling male) was a member of this pack until he dispersed after 30 November 2000.

Suk-Cerney/Beaver Creek Pack - Juneau County - Block 122:

5 wolves; these wolves roamed the Necedah Wildlife Refuge, and may have been 2 groups, but they could not adequately be separated in 127.8 miles of survey by DNR; RLU's and estrus blood were found on 28 January 2001; possibly 1 or 2 pups survived from 2000.

Sandhill Loner - Wood County - Block 121:

1 wolf; a lone male wolf continues to occupy the Sandhill Wildlife Area, after escaping into the area in 1995 (Thiel 2000); track observations by DNR staff and volunteers indicate the wolf continues to roam the 14 square mile fenced wildlife area.

Fort McCoy Loner - Monroe County - Block 123:

1 wolf; a lone male continued to roam extensively on Fort McCoy as determined by 81.2 miles of track survey by volunteers; the wolf has been in this area for the last 2 years.

Yellow River Pack - Juneau County - Block 125:

5 wolves; 5 wolves were detected along 33.2 miles of survey by DNR; the wolves roamed along the Yellow River area east of Necedah; breeding was suspected; 1 or 2 pups survived from 2000; this pack may be part of the Beaver Creek/Suk Cerney Group.

Bombing Range Loner - Juneau & Wood Counties - Block 125:

1 wolf; a single wolf was detected in the bombing range of north Juneau County on 30 November 2000 and 16 January 2001; the January observation may have been 269M, but the earlier observation was prior to dispersal of 269M; 21.3 miles were surveyed in the area by DNR.

DISPERSING WOLVES

Wolf 002F: Wolf 002F was caught as a yearling female in the Wildcat Mound pack in Jackson County on 10 May 1998. The main part of this pack territory is south of Highway 54, but starting in summer 1999, this wolf began to spend time north of the highway. During winter 1999-2000, it appeared that 002F might have formed a new pack near Pray with 2 other wolves. In summer 2000, the wolf roamed widely in the area of the Noch Hanai pack, but in late August she moved further northward. Wolf 002F spent the late summer and fall in the Sherwood area of south Clark County. She was found dead on 22 November 2000 in south Clark County, about 20 miles northwest of her capture site 2 1/2 years earlier.

Wolf M036F: This yearling female was caught in western Gogebic County, Michigan on 5 May 2001. She moved into Wisconsin soon after her capture. In winter 2000-2001, she moved west into the Bad River Reservation, 20 to 25 miles to the west and southwest. Wolf M036F was believed to be initially in the Little Girl Point Pack, but was believed to be part of the Morrison Creek pack during winter. In late winter this wolf may have joined the West Firebreak pack.

Wolf M071F: On 9 March 2001 a female wolf pup (M071F) was found dead from a vehicle collision along Highway I94 in Jefferson County near Johnson Creek. This wolf had been caught as a 40 pound pup on 17 August 2000 in northwest Mackinac County, Michigan. She was lost from her home territory by Michigan biologists some time between late December 2000 and January 2001. The minimum distance traveled would be 300 miles if she went across the north end of Lake Michigan and traveled southwest of Green Bay into Wisconsin. Possibly she may have moved south from Garden Peninsula in Michigan and followed scattered islands 5 miles or less apart from each other to Door County, Wisconsin; this route would reduce minimum miles of travel to 280 miles. In either case, this probably represents a record movement of a wolf pup in North America. A Wisconsin DNR wildlife technician found possible tracks of a wolf in eastern Waushara County on 22 January 2001; this location was 65 miles directly north of the death site. Wolf M071F represents the most southern movement detected on any radio collared wolf from Wisconsin or Michigan. The death site was about 30 miles east of Madison and only 42 miles north of the Illinois border.

Wolf 229F: This wolf had been the alpha female of the Augustine Lake pack in east Ashland County since 1994, and remained the alpha until late 1999. In winter 2000 she joined the west Firebreak pack 12 miles to the north in the Bad River Indian reservation. She returned to the Augustine Lake pack area in later winter 2000, but did not remain in the pack. Wolf 229F settled into an area north and west of the Augustine Lake area along the Penoque Ridge and adjacent areas. She may have raised pups in the area, but none survived to winter. Wolf 229F remained in the Penoque Ridge area through winter 2000-2001, and was found dead in this home range on 14 February 2001. She died from an ear infection and mange.

Wolf 250M: This male wolf pup was caught in the Black Lake pack area south of Clam Lake on 9 September 2000. He remained in that pack area during fall and early winter. From 24 January to 9

February 2001, the wolf roamed 8 to 10 miles northwest of the pack area in the Ghost Lake area; this move may have started as an extra-territory move by the pack, but 250M seemed to remain behind. He returned to the Black Lake pack area on 14 February, and remained there until after 21 February. Wolf 250M made a second trip to the Ghost Lake area 26 February - 6 March 2001. His last locations in the Black Lake pack occurred between 13 March-23 March 2001. After 23 March, wolf 250M made a 17 mile trip to the northwest to the Cable area on 27 March 2001. In early April, wolf 250M traveled through the Ghost Lake area, and began associating with wolf 241F, the possible alpha female of that pack on 24 April 2001.

Wolf 269M: This wolf was caught as a male pup in the Dead Creek pack of northern Monroe and western Juneau County on 17 September 1999. He dispersed northward after 30 November 2000, and on 5 December 2000 was 15 miles to the north in southwest Wood County. Wolf 269M remained in southwest Wood County near the Sandhill Wildlife Area and the National Guard Bombing range until 23 January 2001. After 2 February 2001, the wolf remained in northern Jackson County and southern Clark County north of Pray. His home range in late winter and early spring spread across portions of the Noch Hanai and Two Korner pack and was about 17 miles north of his natal territory.

Wolf 289F: Wolf 289F was relocated 59 miles east from western Oneida County to western Florence County on 2 May 2000 following depredation at a deer farm. During spring and summer, she roamed an extensive area from Boulder Junction, Wisconsin on the west to near Gladstone, Michigan on the east (about 125 miles east-west). By August 2000, it appeared that the wolf had settled down to a home range in eastern Vilas County. The wolf was monitored by satellite telemetry, which did not allow observation of the wolf, and it was not known if she had found a mate. During winter, 289F occupied a 92 square mile home range that centered near Conover. She did continue to make some long movements including 24 miles to the east into Michigan on 2 March 2001 and 23 miles westward toward Trout Lake on 26 March 2001.

Wolf 298M: Wolf 298M was caught as a yearling male on 8 June 1999 in the North Empire pack in west Douglas County. He dispersed westward into Minnesota after 2 October 2000. After 24 October, he joined the Tamarack River pack in Minnesota about 29 miles southwest of the North Empire pack. He remained in this 52 square mile pack in Minnesota throughout the remainder of the winter.

Wolf 309F: Wolf 309F dispersed from the Beaver Creek pack in Juneau County after 4 February 2000. She settled into south Clark/eastern Eau Claire County after 15 May 2000, about 40 miles northwest of her natal territory. She was first seen with another wolf on 15 February in the Iron Run area, and may have found a new pack. As a yearling, she may have been able to breed, and could produce pups this spring.

Wolf 318F: Wolf 318F was caught as a yearling female in the Nineweb Lake pack of northern Vilas County on 10 May 2000. Her summer territory of 98 square miles probably included some pre-dispersal moves. She was found in Michigan on 1 December 2000 near Watersmeet. During the next 2 months, wolf 318F made at least 2 extensive moves north of Bond Falls Flowage, about 31 miles northeast of Nineweb Lake pack territory. Between 1 February and 14 March 2000, she remained mainly in the Nineweb area, but traveled as far south as Sayner in southern Vilas County. After 14 March, she again moved northward and on 3 April was in Houghton County, Michigan, 40 miles northeast of her natal territory. She remained in Michigan in mid-April and may have completed dispersal from her home territory.

Wolf 332F: This adult female wolf was released in western Florence County on 29 May 2000, 51 miles east of a site in western Oneida County where the wolf caused depredation at a deer farm. She moved to the southwest, to southeastern Oneida County. During the winter period, the wolf spent about 64% of her

time in a 10 square mile home range northwest of Pelican Lake in south Oneida County. She did continue to make some long movements into northern Langlade and south Forest Counties. She traveled as far south as the Lily area of Langlade County on 26 December 2000, and 23 miles southeast of her winter home range. On 5 March 2001, she was east of Laona in Forest County and 34 miles east of her Pelican Lake home range. Wolf 332F probably had not found a mate during winter.

Wolf 337M: Adult male 337M was caught and collared in the Wildcat Mound pack territory of Jackson County on 17 July 2000. After 30 November 2000, he began moving eastward. On 8 December he was 40 miles to the east in Adams County, and 2.5 miles east of the Petenwell Flowage on the Wisconsin River. By 12 December 2000 he was 18 miles to the east near Hancock in western Waushara County. From 12 December 2000 to 10 January 2001, wolf 337M traveled south 44 miles along the western side of U.S. Highway 51 (I39). The wolf was last located on 10 January 2001, about 3 miles northwest of Portage and 78 miles southeast of his territory. An adult female wolf traveled through this same area in May 1999 (Merrill and Mech 2000), and a yearling female were killed on I39, 3 miles north of Portage in August 1994 (Mech et al 1995).

WOLF TELEMETRY SUMMARY

A total of 112 different wolves, including 30 different radio collared wolves, were seen by DNR pilots (Table 3). Three additional collared wolves were not seen by pilots, but were assumed to be by themselves. Excluding wolves outside the state, and including 2 satellite monitored wolves, a total of 110 wolves were detected in Wisconsin through radio telemetry. Wolves detected by radio telemetry represents 44% of all wolves counted in the state. Individual wolves were observed 36% of the time flown, which exceeds the rates of 30% in 1999-2000, and 25% in 1998-1999. Improved snow conditions in winter 2000-2001 probably accounted for a better rate of observation. Average pack size of groups flown by pilots was 4.2 wolves for 26 packs (range 2-9). The Chippewa River pack with 9 wolves was the largest pack observed.

WOLF MORTALITY AND DISEASE

Seven wolves actively being monitored in the state died during the winter study period (Table 6), and 2 wolves whose signals had been lost (274M and 290M) died during the period. Causes of death of these 9 wolves were: 4 sarcoptic mange, 1 inner ear infection and mange, 1 unknown disease or infection, 1 shot, 1 killed by other wolves, and 1 died from unknown causes. Mortality was also determined on 3 non-collared wolves and a collared wolf from Michigan, all of which had died from vehicle collisions. An adult male (280M) monitored by Wisconsin DNR, died in Minnesota from mange.

Sarcoptic mange appeared to be fairly prevalent in the wolf population in the winter 2000-2001. A total of 5 actively collared wolves (including 280M in Minnesota) of 35 wolves on the air in late fall died with severe cases of mange. Therefore, representing losses of 14% of collared wolves in Wisconsin. No wolves without radio collars were found dead with mange, but reports were received of several mangy wolves being observed. Wolves that died from mange generally crawled into dense cover in secluded areas, and would have been difficult to find without radio telemetry. Both wolves in the Totagatic River pack (294M, 295F) appeared to have mange when observed from the air, but the two survived the winter. Therefore, some wolves affected by mange probably survived the winter.

Death due to mange has been infrequent in recent years. In winter 1995-1996, 4 of 26 collared wolves died with severe cases of mange, similar to the rate of losses found in winter 2000-2001. Winter 1995-1996 was fairly severe, but recent winters have been very mild. Winter 2000-2001 was more of a normal winter, with deep, fluffy snow over most of the winter.

WOLF DEPREDACTION

Two wolf depredations occurred during the period October 2000 through March 2001. On 4 December 2000, 2 hound dogs used for hunting bobcat were killed by the Shoberg Lake pack near the Brule River in Douglas County. On 8 March 2001, a single wolf or wolf-dog hybrid killed 65 poultry (chickens, turkey, pheasants) at a residence on the edge of Hayward in Sawyer County. Payments are still pending, but the WDNR plans to reimburse for both depredations.

A farm in northern Burnett County that has had chronic problems with wolf depredation on calves since 1995, had 2 calves killed by wolves in summer 2000. In the fall, when the farmers rounded up their cattle, they found an additional 30 calves missing. The farmers have requested that WDNR reimburse portions of these losses. The Department has not determined yet what portions of these losses will be reimbursed.

REPORTED WOLF OBSERVATIONS

A total of 56 reports of "possible" or "probable" wolf observations were received during the January-March 2000 quarter (Table 5). Wolves were reported from 23 Wisconsin counties including 2 southern Wisconsin counties far removed from wolf range (Jefferson, Rock). The wolf pup from Michigan (M076) did travel as far south as Jefferson County and wolf 337M from the Wildcat Mound pack traveled as far as Columbia County. No reports were received for 7 counties with known wolf packs.

Reports of wolf observations were similar to the previous quarter (53) and the same quarter in 2000 (50). Highest report rates were from Vilas County, and may have included observations of 318F and 289F that moved extensively through the county.

VOLUNTEER TRACK SURVEYS

Surveys were returned for 55 survey blocks (55%) of 100 survey blocks assigned. This compares to 61% of 89 blocks in 2000 surveyed, and 65% of 54 blocks surveyed in 1999. The average survey block was surveyed 3.1 times along 65 miles and covering 12.2 hours. The average survey covered 21.0 miles and lasted 4.0 hours. Volunteers detected 125-135 wolves along 3560.1 miles of tracking and DNR trackers detected 187-194 wolves along 4081.1 miles.

Both volunteers and DNR jointly examined 44 blocks. Neither found wolves in 6 of the blocks. Volunteer count for the other 38 blocks was 114 to 126 wolves, and DNR count was 121 to 126. In these blocks, volunteers found more wolves than DNR in 18 blocks, volunteers found less than DNR in 10 blocks, and both found the same numbers for 10 blocks. Although counts for individual blocks vary somewhat, overall counts by volunteer trackers were similar to DNR wolf program personnel.

STATEWIDE WOLF COUNT

The Wisconsin wolf population in mid or late winter 2000-2001 consisted of a minimum of 251 to 253 wolves in 66 packs and 10 loners (Table 7). Last year 248 to 259 wolves were detected, therefore the population has remained about the same. The annual rate of increase since 1985 has been 19% annual but this is only the second time in 16 years that the population did not increase between years (Figure 2). The population declined 11% in 1993, the year after sarcoptic mange was first detected in Wisconsin wolves.

In winter 1995-1996 when 15% of collared wolves died with mange, the population still increased by 19%, perhaps due to some compensatory factors.

An estimated 74 to 101 wolf pups survived from 2000. Using 88 pups as the midpoint and assuming 60 potential breeding females in 2000, estimated pup survival was 28% in 2001 (88 pups/60 females x 5.2 pups). Of 60 potential packs raising pups, 18 apparently had no surviving pups.

The area of occupied wolf territories included about 2438 square miles, and allowing 37% for interstitial areas (Fuller et al 1992), would cover an area of 3340 square miles. Therefore 241-243 territorial wolves occurred at a density of 1 wolf/14 square miles.

The system used for counting wolves in Wisconsin probably under counts lone wolves. Although 3 wolves of 30 observed radio collared wolves were only seen by themselves, all three were only observed once or twice. One of these included a relocated wolf that was probably alone due to her translocation. A second lone wolf was an alpha that was probably the last remaining member of her pack. Even dispersing wolf 318F returned several times to her natal territory. Wolf 229F may have been by herself, but she was never observed from the air. Therefore, it appeared that possibly only 1 or 2 of 33 collared wolves were loners throughout the period (3 or 6%). In the past we have determined that a mean of 8.2% of collared wolves were loners throughout the winter (Wydeven et al. 2000). Overall only 10 loners were detected this winter (4.0%). Some loners are probably not detected, but it appeared that a low percentage of wolves were loners in winter 2000-2001.

PLANS FOR NEXT QUARTER

Live trapping of wolves will be done from early May until early September. Emphasis will be to collar members of new packs that have not previously been collared. Aerial locations will be obtained weekly throughout the period. Howl surveys will be conducted from late June to early October. USDA-Wildlife Services will investigate all suspected wolf depredations and if any wolves cause repeated depredation at farms, they will be live trapped and relocated across the state.

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Note: This report is a preliminary report and should not be construed as a finalized publication. Some of the numbers of pack size, composition, population figures, and other information may change, as more data becomes available. Persons wishing to cite figures within the report should consult the author.